(12) UK Patent Application (19) GB (11) 2 316 288 (13) A

(43) Date of A Publication 25.02.1998

(21) Application No 9617015.4

(22) Date of Filing 13.08.1996

(51) INT CL[6]
A01M 1/22

(52) UK CL (Edition P)
A1M MDB

(56) Documents Cited
US 4074456 A

(58) Field of Search
UK CL (Edition O) A1M MDB MDD
INT CL[6] A01G 13/10, A01M 1/00 1/02 1/10 1/22
Online:WPI

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(54) Slug trap

(57) An electrocuting slug or snail trap has an array 5 of closely spaced electrocuting conductors. Supply 4 to the conductors takes place at timed intervals only at night via a light activated switch 16 and a timer 17. A plurality of slave traps (21 figure 3) may be connected to the main trap (20). The trap may be battery, solar or mechanically powered.

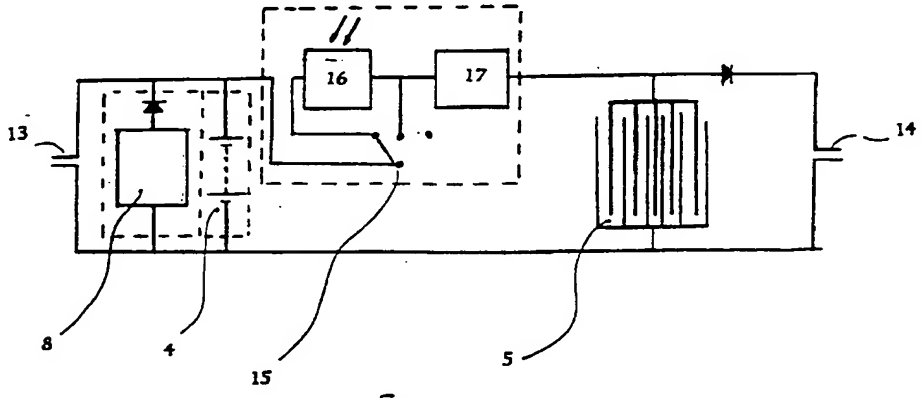

Fig 2

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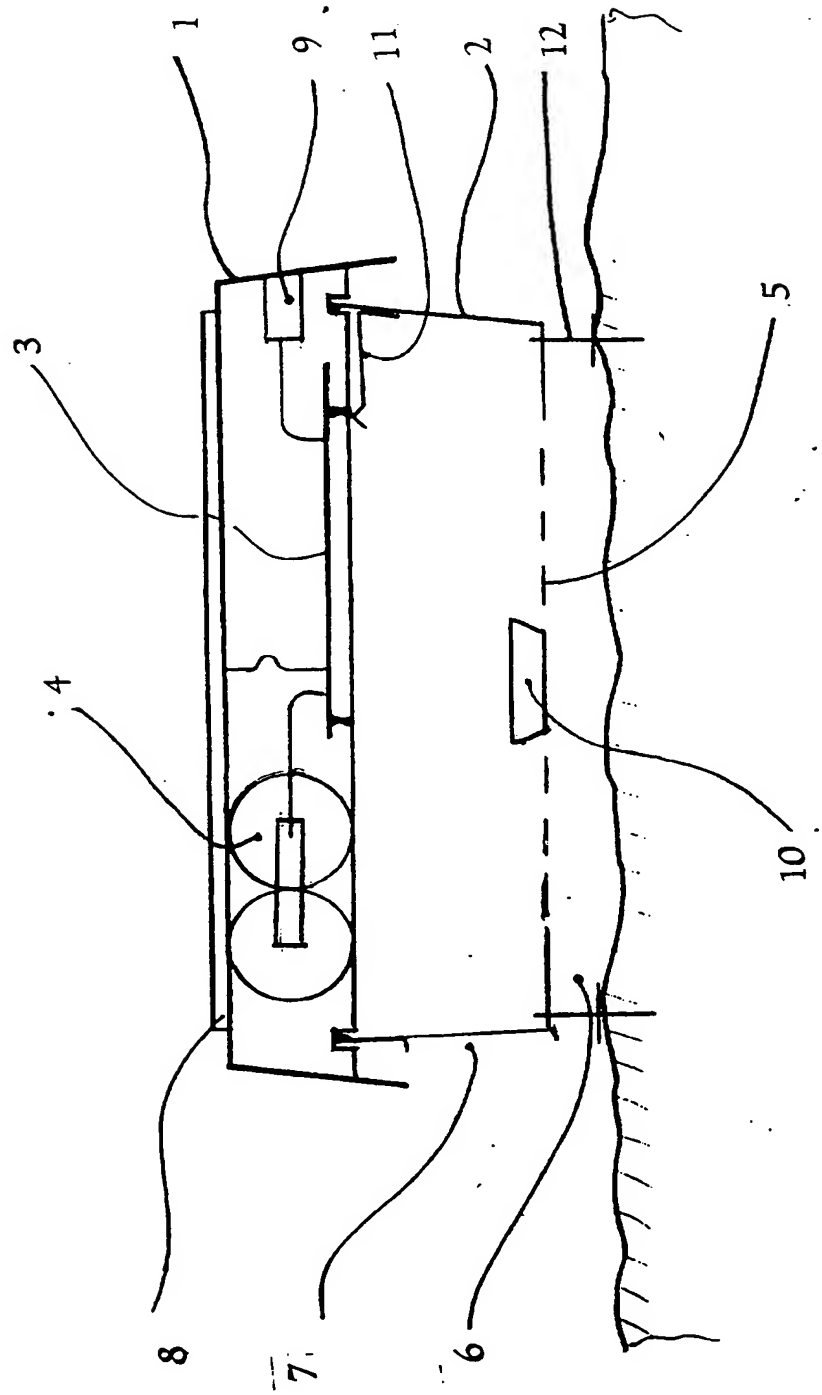


Fig 1

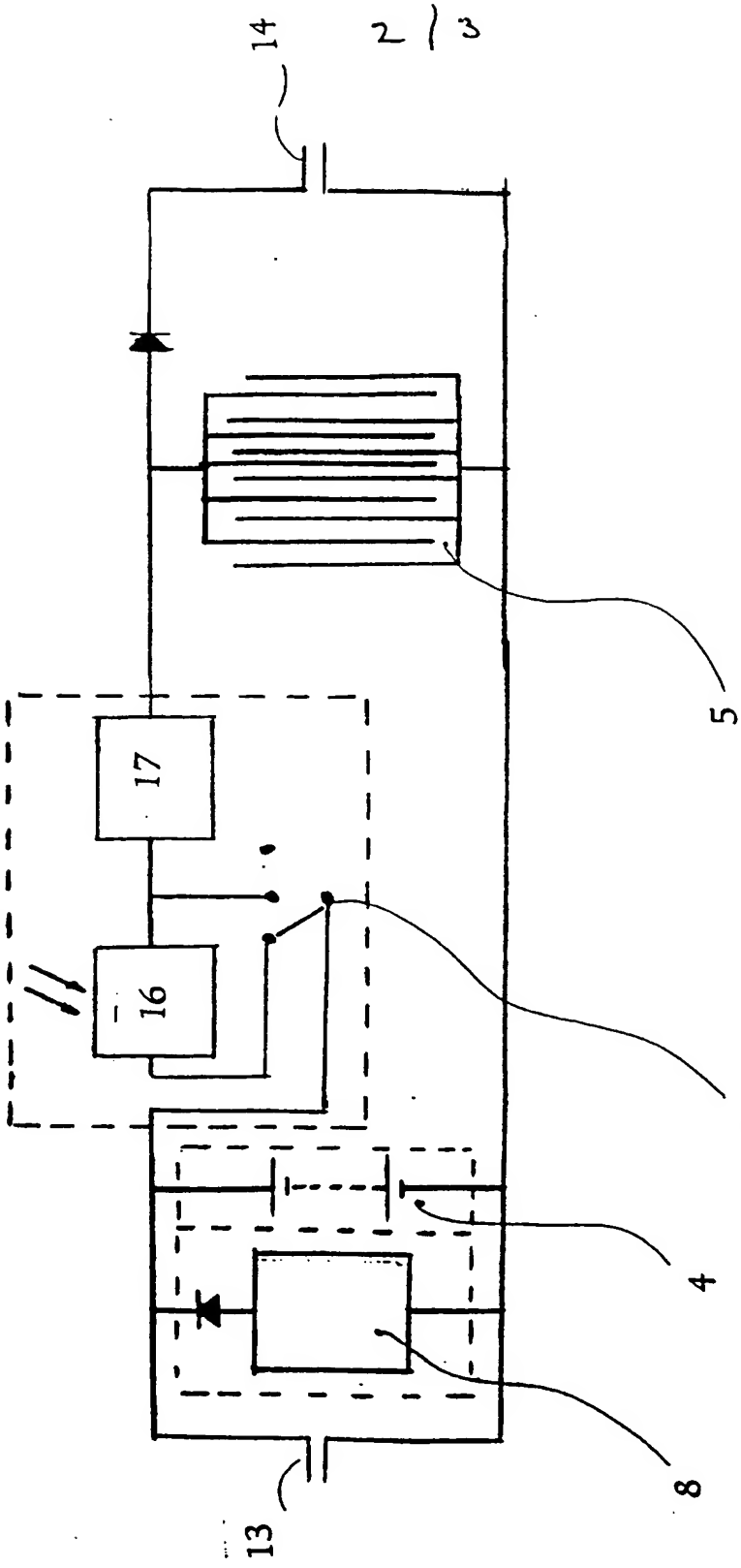
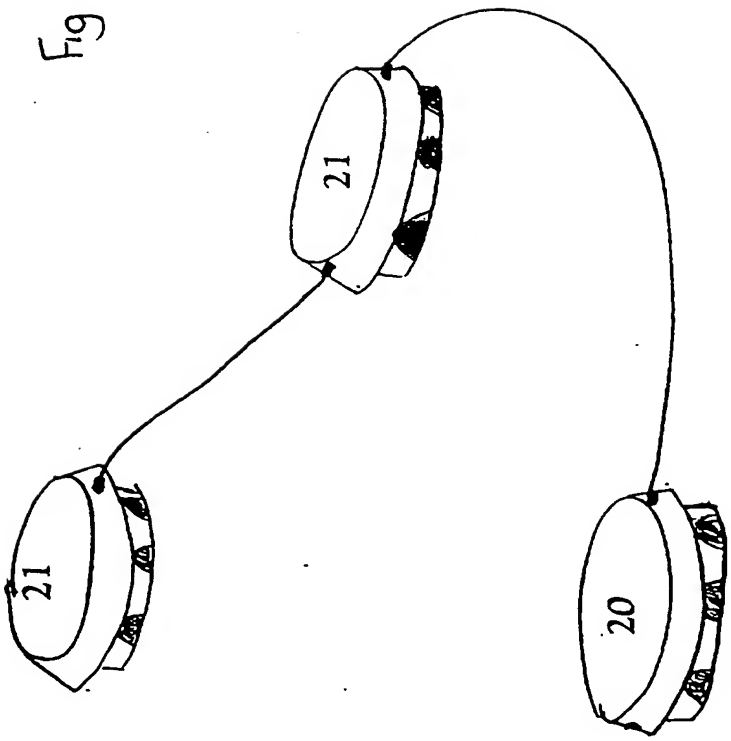


Fig 2

Fig 3



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Title: Electric Destruction of Pests

This invention concerns the destruction of pests by means of an electric trap. It is intended to protect plants, houses etc against the effects of any small creature but is particularly intended to destroy gastropods like slugs and snails.

In the past there has been a tremendous amount of research directed at combating gastropods and other pests. Many insecticides and other chemicals have been used, for example metaldyhide in slug bait. As with all chemicals, its use has inherent problems for example, it can be eaten by animals inadvertently.

Safer options are electric deterrents. For example those which have two or more closely spaced conductors. The conductors have a constant potential across them so that when a creature bridges the space it is electrocuted. These electric deterrent devices have drawbacks. They use high voltages and if a slug is stuck between the conductors then the current drain across the conductors will be high. Also, many creatures feed at night so a constant 24 hour protection is not required.

My invention addresses the above problems. In general it involves a new design of pest trap having a controlled supply of electricity to closely spaced conductors. The control increases the efficiency of a trap. The main attributes of the invention are set out in the attached claims.

The following description and drawing indicate one way in which the invention can be put into practice.

Figure 1 is an illustration of the layout of the trap.

Figure 2 is a schematic circuit diagram of the same trap.

Fig 3 is an illustration of a master trap and slave traps as they would be deployed.

Figure 1 shows a trap having a top housing 1 enclosing electronics 3 and batteries 4. This housing has exterior parts at 9 which are; a power input socket 13 (see figure 2, a power outlet socket 14 and a selector switch 15, which are discussed later. There is also an optional solar panel 8 on this model.

There is a lower housing 2 which is detachable form the top housing 1 has an electric grid 5, pest access points 7 allowing access of pests to the grid 5, a bait container 10 for enticing the pests to the grid 5 and spring contacts 11 which connect the grid 5 to its power supply in the top housing 1. In this model legs 12 are used to raise the trap and provide additional pest access 6 to the grid 5, which is exposed on its under side.

Figure 2 shows a simplified circuit for the trap illustrated in figure 1. Rechargeable battery 4 powers grid 5 which is simply an array of closely spaced conductors made eg from copper. Each adjacent pair of conductors has a potential across them to electrocute any pest that bridges them when they are energised. The shape the conductors could be straight for a square trap or concentric circles for a circular trap.

Controlling the power to the grid are two elements, a light activated switch 16 and a timer and current regulator 17. Their controlling circuits are conventional and are therefore not shown.

In use current from the battery 4 is controlled so that it only passes the light activated switch 16 in low light conditions ie at night when most of the pests come out to forage. Timer 17 energises the grid only periodically eg so

that no current is wasted on already dead pests stuck across the conductors of the grid 5. Built into this timing circuit is a current regulator which limits the amount of current flowing through the grid so that the battery is not drained too fast when a large number of pests are stuck across the conductors. The selector switch 15 has three settings, firstly the current has to flow through both the light activated switch 16 and the timer, secondly the current flows only though the timer and thirdly an off position. Thus in operation the current is controlled such that either:-

a) There is no current flowing in the controlling circuit, or;

b) Current flows through the timer/regulator circuit only, thereby alternately energising and de-energising the conductors, or;

c) The current flows first through the light switch and then through the timer, thereby energising/de-energising the conductors only in low ambient light conditions.

Figure 3 shows a master and slave set up. The master trap 20 is as shown the figures 1 & 2. The slave traps 21 are simplified to reduce costs. The electrical parts shown in figure 2 in the chain dotted boxes have been removed leaving an input socket 13, a grid 5 and an outlet socket 14.

In use the slaves 21 are powered by the master 20, and are connected by a lead which has a plug at each end, joining the outlet of the master 20 to the input of the slave 21 and so on. There will be a limit to the number of slaves that can be joined to the master, this will be in the order 4 slaves to 1 master.

The input socket 13 on a master trap is used for recharging batteries 4 and/or for supplying power continuously, either to replace the batteries as source of power or to prolong

battery life. The solar panel could also replace the batteries or will also prolong battery life. The unit could be powered by any source of electricity including a mechanical energy store eg a clockwork generator.

Experiments have shown that 12 volts is more than sufficient to kill slugs etc. The voltage of the trap may be from say 9 volts upwards. Higher voltages can be produced by providing more cells or by passing pulsed (via the timer) electricity through a inductive coil.

The grid 5 preferably has 3 mm wide conductors with a similar spacing between the conductors, for gastropods. Variants may have different dimensions depending on the pests targeted.

The timer 17 is set to energise the grid 5 every 15 minutes for a period of 30 seconds for gastropods. Again different timings would be used for other pests.

Bait may be used in the container 10 eg yeast and bran. The access points 7 can be spaced all around the housing 2 (as shown in figure 3) in order to allow the smell of the bait to permeate in all directions.

Of course the conductors need not be flat. In a different trap, which is not illustrated, the conductors are mounted on a non-linear surface. They may be mounted on the walls of a tunnel, hemisphere or around the inner circumference of a tube.

Claims

1. A pest trap having the following attributes: an array of closely spaced electrocuting conductors; an electrical power supply to the conductors; a light activated switch which can interrupt the supply; and a timer switch which can also interrupt the supply.

2. The pest trap of claim 1, the light activated switch being connected in series with the timer switch so that both have to be closed before the supply can reach the conductors.

3. The pest trap of claim 1 or 2, at least some of the power supply coming from a rechargeable battery.

4. The pest trap of claim 1,2 or 3, having also a power input socket for recharging the battery in claim 3 and/or energising the conductors via the light activated switch and the timer switch.

5. The pest trap of claims 1,2,3 or 4 having also a power outlet socket for connecting one or more additional slave traps to the pest trap so that the slave trap(s) can be powered by the supply via the light activated switch and the timer switch.

6. The pest trap of claim 5, the slave trap(s) merely having a power input socket, a power outlet socket and electrocuting conductors.

7. The pest trap of any of claims 1 to 5 having a selector switch which can bypass the light activated switch.

8. The pest trap of any of claims 1 to 5 having a solar panel or a mechanical energy store either of which provides at least

some of the power supply.

9.The pest trap of any preceding claim having a top housing enclosing electronic parts of the trap and a lower housing supporting the conductors, this lower housing having pest access points and a container for bait to entice the pests into the trap where they are electrocuted by current from the conductors.

10. The pest trap of any preceding claim, having legs which can keep the trap off the ground so providing a gap under the trap in which pests can gather and be electrocuted by the conductors from above.

11. The pest trap of claim 9 or 10, the top and lower housing being connected in a detachable way.

12. The pest trap of any preceding claim, the power supply voltage being at least about 9 volts.

13. The pest trap of any preceding claim, incorporating a current regulator in the power supply.

14 The pest trap of any preceding claim, the timer switch closing about every 15 minutes for 30 seconds.

The Patent Office

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Application No: GB 9617015.4 **Examiner:** Ross Cavill
Claims searched: 1 to 14 **Date of search:** 23 September 1996

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.O): A1M (MDB,MDD)

Int Cl (Ed.6): A01M 1/00,/02,/10,/22; A01G 13/00,/10

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	US 4074456 (TIDWELL) whole doc	All

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.